

WHAT IS CLAIMED IS:

1 1. An improved catheter system of the type including (a) a tubular  
2 catheter body having a proximal portion, a distal portion, and a lumen therethrough; (b) a  
3 drive cable rotatably received in the lumen; and (c) a hub assembly secured to a proximal  
4 end of the drive cable, wherein the improvement comprises a rotary transformer disposed  
5 within the hub assembly, the rotary transformer including a first ferrite core and a second  
6 ferrite core, the second ferrite core contacting the first ferrite core with substantially zero  
7 clearance therebetween to promote electrical induction between each core.

1 2. The improved catheter system of claim 1, wherein the first ferrite  
2 core is stationary, and wherein the second ferrite core is rotatable.

1 3. The improved catheter system of claim 2, wherein the rotary  
2 transformer further comprises a friction limiting material disposed between the rotating  
3 ferrite core and the fixed ferrite core.

1 4. The improved catheter system of claim 1, wherein the first ferrite  
2 core is biased against the second ferrite core.

1 5. The improved catheter system of claim 1, wherein the first ferrite  
2 core is free floating within the hub assembly.

1 6. An improved catheter system of the type including (a) a tubular  
2 catheter body having a proximal portion, a distal portion, and a primary lumen  
3 therethrough; and (b) a drive cable having a cable body and a cable lumen rotatably  
4 received in the lumen, having at least one lead wire disposed in the cable lumen, wherein  
5 the improvement comprises a support member disposed within the cable lumen to provide  
6 strain relief to the lead wire when the lead wire is subjected to a tensile load, the support  
7 member extending substantially the entire length of the lead wire.

1 7. The improved catheter system of claim 6, wherein the support  
2 member comprises a flexible multi-filament material.

1 8. The improved catheter system of claim 6, wherein the support  
2 member comprises Kevlar®.



6 wedge lumen formed in the wedge allowing communication between the primary lumen  
7 and the guidewire lumen.

1                    15.     An improved catheter system of the type including (a) a tubular  
2 catheter body having a proximal portion, a distal portion, and a lumen therethrough, and  
3 (b) a drive cable rotatably received in the lumen, wherein the improvement comprises the  
4 drive cable comprising a first inner coil, a second inner coil, and an outer coil, the outer  
5 coil being wound in a direction opposite to the inner coils, the first inner coil expanding  
6 against the outer coil and the second inner coil expanding against the first inner coil when  
7 the drive cable is rotated, thereby increasing the column strength of the drive cable.

1                    16.     The improved catheter system as in claim 15, wherein the outer  
2     coil contracts against the first inner coil when the drive cable is rotated.

1                    17.        An improved catheter system of the type including (a) a tubular  
2 catheter body having a proximal portion, a distal portion, and a lumen therethrough, and  
3 (b) a drive cable rotatably received in the lumen, wherein the improvement comprises a  
4 first tubular member and a second tubular member arranged in a telescoping engagement,  
5 wherein the first tubular member is formed at least in part from a material, the material  
6 being a plastic or a polymer material, such as polyetheretherketone (PEEK).

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